August 2011

Energy Services BULLETIN

Western's monthly energy efficiency and renewable energy newsletter dedicated to customer activities and sharing information on energy services.

Tri-State hosts science training for co-op area teachers

A group of 27 teachers had the opportunity this summer to take part in a one-of-a-kind professional development institute hosted by Tri-State Generation and Transmission Association and taught by The Keystone Center.

For two days in late June, the board room at Tri-State's Westminster, Colo., headquarters looked more like a laboratory as teachers from the G&T's service territory studied "CSI: Climate Status Investigations." The program teaches educators how to cover the issue of climate change in the classroom through math, science, language arts, social studies and more. CSI trainees learn to use the curricula's hands-on style of inquiry to explore the science of global climate change, the primary sources of greenhouse gases and potential solutions.

Most of the attendees were from communities served by Tri-State member electric cooperatives in Colorado, Nebraska, New Mexico and Wyoming. Yampa Valley Electric Association, a Western customer that is not a Tri-State member, sent a teacher from its service territory, and Tri-State also invited a teacher from a charter school in Fort Collins to attend.

Teachers representing Tri-State Generation and Transmission's member systems participate in lab experiments during a training conference, "CSI: Climate Status Investigations." (Photo by Stephen Collector)

Benefits

The Keystone Center developed the curricula and the teacher training with its Science and Public Policy division, which facilitates public policy debates on contentious issues. That experience, with its focus on reaching consensus, resulted in a lesson format that encourages critical thinking. "We liked that the program presents the material in a way that allows students to draw conclusions after the experiments," said Gigi Dennis, Tri-State's senior manager of external relations.

The material covers the "three Es" of different fuel supplies—social equity, environmental impacts and economics. Students learn how to evaluate the true cost of all fuel sources, something Dennis believes has not been adequately communicated. Tri-State's mission is to provide customers with affordable electricity, she added."The program helps to give future consumers

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What's inside

Renewable energy could reshape Imperial Valley's future

In the far southeastern corner of California sits Imperial County with an abundance of renewable energy resources and a utility—Imperial Irrigation District (IID)—with a vision for turning that wealth into economic development.

The Imperial Valley's solar, wind, biomass and geothermal resources could generate 42,000 megawatts by 2016, according to the "best-case scenario" presented in a feasibility study IID commissioned in 2008. Even the more likely "base case" of 2,000 MW—mainly of geothermal power—leaves summer-peaking IID with electricity to spare. This conservative estimate would also bring the region around $26 million annually in transmission revenues, about 7,000 construction jobs and 1,000 long-term O&M jobs.

The consumer-owned utility was already on the path to development before the state passed its renewable energy standard of 33 percent renewables by 2020. The writing was on the wall as early as 2004, said IID spokesperson Rosa Maria Gonzales. "We saw an immense amount of renewable energy in our own backyard, and the benefits the state's adoption of a portfolio standard would bring to the region," she recalled. "The opportunity is there for the Valley to be a major energy exporter to Southern California, and to create economic growth in a region that desperately needs jobs."

Ground leveling crews prepare a 123-acre parcel of IID land for construction of a 20-megawatt photovoltaic project by SunPeak Solar. (Photo by Imperial Irrigation District)

Geothermal player

The Imperial Valley already exports energy—much of the region's existing 552 MW of geothermal power goes to the Los Angeles and San Diego areas. According to a resource assessment IID commissioned last year, geothermal resources in the Valley could potentially generate 2,500 MW. The district has several projects in different phases to tap this potential.

IID has teamed up with the Southern California Public Power Authority and Los Angeles Department of Water and Power (LADWP) to develop a 49.9-MW geothermal project on land LADWP owns in the Valley. IID expects to receive 16.5 MW from the plant by 2017. The partnership is still "prospecting" for the site, using the assessment, which employed thermal satellite imaging, hyper-spectral technology, geologic and hydro-geologic data and public reports.

GTherm Corp. is building a pilot project on IID-owned land that will produce another 3 MW of geothermal power for the district. The plant features a promising new closed-loop technology that can generate electricity using less water—very attractive in a desert environment. If the pilot proves successful, GTherm could expand the plant to supply IID with an additional 20 MW by 2016.

Another project IID is researching independently would develop an additional 49 MW by 2016. In California, projects under 50 MW are permitted through local jurisdictions rather than the California Energy Commission (CEC), which is generally a lengthier process. Should IID choose to expand any of the projects—which Gonzales said is likely—the county would be able to permit a second plant under 50 MW, as long as it is more than 5,281 feet from the original plant. According to

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Energy Services Bulletin

The Energy Services Bulletin is published by Western Area Power Administration for its power customers. The mailing address is Western Area Power Administration, P.O.Box 281213, Lakewood, CO 80228-8213; telephone (720) 962-7508.

Editor: Kevon Storie
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Imperial Valley

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state law,, if the second project is sited within a mile of the first, the CEC would have to permit both to adequately evaluate their direct, indirect and cumulative impacts.

Great solar potential

While geothermal energy may be IID's best developed renewable resource, solar power has the greatest potential. IID's feasibility study estimates that concentrating solar technology alone could generate up to 28,600 MW, and places Imperial Valley's total solar potential at 28,946 MW.

The solar industry also has the advantage of being well represented in IID's service territory. Palm Desert-based SunPeak Solar is building a 20-MW photovoltaic installation for IID near the town of Niland in the Salton Sea area. Expected to operate at full capacity by next February, the completed project will supply the daytime energy needs for the entire community of about 3,000 people with energy to spare.

More solar developers in the region have responded to IID's request for proposals to build another 30 MW solar project. The technology for the project has not been selected yet, but Gonzales observed that IID is likely to find a contractor that meets the project's needs among the many solar companies in the Imperial Valley. "Working with local companies tends to be the more cost-effective choice," she said, "and, it's good for the local economy."

Small biomass

Although biomass, wind and water are not as abundant as geothermal and solar resources, IID is not ignoring the opportunities that these resources represent.

The decommissioned Mesquite Lake facility near El Centro is finding new life as the GreenHunter Mesquite Lake biomass power plant. The project has been through several iterations, testing such feed stocks as animal, agricultural and wood waste, Gonzales said. IID has signed a power purchase agreement with GreenHunter for 18 MW, and will start receiving electricity from the plant in 2012.

There are more than 300,000 head of cattle in the Imperial Valley whose manure could be turned into electricity through anaerobic digestion. One dairy farm already has a digester with 600 kW capacity, and the feasibility report estimates that biogas from 1,800 head of cattle that is currently being vented could be harnessed for 1.8 to 2.8 MW of electricity. Making the most of this resource, IID has also tested power generation at its facilities using beef tallow.

The report also cites municipal waste as a potential resource, noting that the Mesquite Regional Landfill could produce 22 MW worth of landfill gas by 2016.

Besides producing biomass, agriculture also creates opportunities and uses for small wind and hydro projects. IID operates 32 MW of hydro plants along the gravity-fed canal system that brings 300 million acre-feet of water into the Imperial Valley each year. A contract with the Yuma County Water Users Association adds another 5 MW to IID's hydro generation. "Some companies have offered proposals to build small hydro facilities along the All-American Canal," added Gonzales.

Although IID is not currently considering wind development, the feasibility report places the technical potential from small turbines at 30 MW of capacity. Behind-the-meter farming and commercial applications, and off-the-grid electrification would be the most likely uses for small wind technology. Such installations are seldom cost-effective, especially since IID has the lowest electricity rates in Southern California. But volatile energy prices, more efficient technology and future environmental regulations might someday improve the equation.

Shipping it out

Of course, it is one thing to have or even develop all those resources, but something else to get that electricity to the market—and IID has that covered, too.

In March, a ceremony at IID's Midway Substation in Calipatria dedicated Phase I of the Midway-Bannister Transmission Project.

IID completed the first power line designed specifically to carry renewable energy six months ahead of schedule and $2 million under budget. The transmission project helped developer EnergySource secure funding for its 49.9-MW Hudson Ranch I geothermal project. The developer will pay $4.6 million toward the cost of the transmission expansion.

Part of IID's overall transmission expansion plan, the ultimate goal is to boost its export capacity to San Diego Gas and Electric to the south and the California Independent System Operator to the north.

Renewable developers building in the Valley will pay for transmission access and recover their investments via transmission credits. But for IID, its investment in exporting renewable energy is an investment in a brighter future for its community.

For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb2.aspx

Transmission workshop creates networks, possibilities

*By **Amber Rodriguez**, Western Corporate Communications*

Craig Knoell of Western gives workshop participants an overview of the Transmission Infrastructure program.

Meeting Transmission Challenges in the Rocky Mountain Region, a workshop held June 21 in Fort Collins, Colo., proved that "if you plan it, they will come."

Western brought together transmission customers, tribes, developers, state and Federal agencies and utilities to discuss Western's transmission planning and services and to discuss transmission challenges in the region.

The workshop included presentations from Western, National Renewable Energy Laboratory, Wyoming Infrastructure Authority, New Mexico Renewable Energy Transmission Authority, Colorado Governor's Energy Office and Xcel Energy Services.

"There is need for transmission to support new generation across Western's 15-state service territory," said RM Contracts and Energy Services Specialist and workshop host Bob Langenberger. "But there are regulations, competing state needs and the question of where generation is built and the transmission to get it to market."

With several organizations and different interests represented, the workshop pointed out the common desire to develop interconnections to the transmission system. "It's important to come together, identify all those interests and find good investment solutions that best meet those desires, while maintaining the power grid's reliability," said Desert Southwest's Transmission Services Manager Ron Moulton.

Moulton recognized how important this meeting was for Western and its customers. He explained, "There's a considerable amount of energy needs in Western's service territory. It's important for us to understand customer needs and concerns to meet those needs in an environmentally-friendly and cost effective way."

Beyond requirements

Holding the workshop satisfied the local transmission planning process requirements for Federal Energy Regulatory Commission Order 890 as outlined in Western's Open Access Transmission Tariff. The OATT requires Western to conduct open public planning meetings where electric transmission stakeholders can comment and provide advice to help Western understand its customers' forecasted transmission needs. However, the workshop did more than meet requirements; it allowed Western to reach out to individuals and organizations across the board.

"This workshop gave us the opportunity to reach beyond our customers to a wide range of developers and other interested parties. We used this opportunity as a public outreach to help foster relationships we wouldn't normally get. We wanted developers to learn how to work with Western and this was our way of saying 'this is how you reach out to us,'" said Langenberger.

Participants were impressed with the amount of information packed into the workshop, and appreciated the Q&A session at the end.

Transmission services

Since Western is in the business of moving power as well as marketing it, it's important for the agency to proactively reach out to the public and let stakeholders know what is offered and how they can benefit from its services.

Transmission planning requires cooperation between organizations, including Western, to conduct the series of interconnection

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Transmission workshop *from page 4*

feasibility studies and evaluations. "The planning process takes time and coordination to develop an electric infrastructure that maintains reliability and meets network load growth and allows Western to continue to provide reliable, low-cost electric power," said Langenberger.

The workshop provided an overview of who Western is and its mission and perspective on building transmission interconnections. Attendees also walked away with a good understanding of how Western maintains reliable electric service, how it is currently improving the efficiency of electric system operations and its ability to support new investments in transmission infrastructure.

"I gained a broader understanding of Western's different business areas and what is involved in developing clean energy projects on the transmission system—that is, the criteria Western has to consider in going after new projects. It was also great to meet new people in the wind industry," commented Platte River Power Authority System Planning Engineer Jeremy Brownrigg.

Western's Transmission Planning Management Team presenters actively explained the agency's ability to address transmission system operations issues. "Our goal was to help attendees understand that Western is a player. [We're] a resource for achieving their transmission needs and a willing partner with a variety of ways to help them," Moulton commented.

Workshop a success

Workshop participants directed a variety of questions to presenters. Questions ranged from issues the entire industry is facing to the specifics of interconnection partnership guidelines, responsibility for costs and the consequences of dropping out of the transmission queue. The open dialogue session allowed for extremely informative conversations to develop. Even the presenters walked away from the conference with a broadened perspective.

Overall, the workshop provided an excellent opportunity to understand Western's mission and services, as well as information on how developers can benefit from Western's expertise and resources.

"Tri-State and Western have many common interests and I need to be apprised of Western's formal plans for transmission. I wanted to meet the people working with Western to fund, plan and develop wind projects. I got what I came for. I got to speak with Western employees and others about matters of mutual interest," commented Blane Taylor, a senior manager with Tri-State Generation and Transmission.

Didn't make?

The workshop presentations are available to answer your questions and concerns about transmission issues in the Rocky Mountain region. "We are committed to continually bringing the right people together," said Langenberger.

For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb3.aspx

Technology Spotlight:

Smart Grid—Are You Ready?

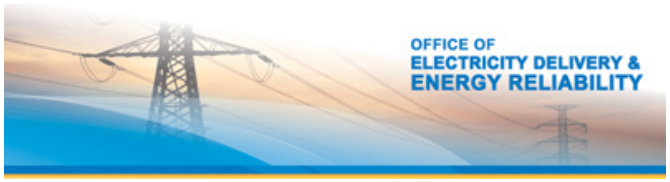
If you work in the power industry, you have undoubtedly heard of the Smart Grid.

The Department of Energy's Office of Electricity Delivery and Energy Reliability has been leading the charge toward a newer, smarter grid in a variety of ways, including:

- Working with the National Institute of Standards and Technology (NIST) to develop robust Smart Grid standards (ensuring that utility investments stand the test of time)
- Testifying before congress on the need for cyber-security for the new electric infrastructure
- Providing billions in grants funded by the American Recovery and Reinvestment Act to help get major installations of Smart Grid projects underway

Of particular interest is this blog post by Patricia Hoffman, the Assistant Secretary for the Office of Electricity Delivery and Energy Reliability. In it, Ms. Hoffman asserts that one of the greatest assets for utilities in the age of the Smart Grid is going to be some good old-fashioned customer service know-how.

Specifically, she claims, utilities should be focusing on customer service and communications to ensure that customers thoroughly understand the value of the Smart Grid. Which do you prefer to see in the nightly news: a satisfied customer proudly displaying his in-home energy management system or an angry customer waving a sign to protest the installation of smart meters? Often the reactions of your customers can be influenced by your up-front investments in education and outreach, as well as your willingness to listen to—and communicate with—your customers. Getting out ahead of the demand for information could help make your efforts go much more smoothly.



These organizations offer resources to help utilities prepare for the transition to a more modern and flexible transmission system. (Artwork by Office of Electricity Delivery abd Reliability, National Institute of Standards and Smart Grid Information Clearinghouse.)

Of course, in order for utilities to communicate what the Smart Grid means to their customers, investors and regulators, the utilities must understand the concepts thoroughly themselves. To effectively communicate that the Smart Grid is more than just remote meter reading, you first need to lay the foundation for success through outreach before your first infrastructure dollar gets spent or your first smart meter gets installed. So what information sources are out there to help you educate yourself and your customers?

Well, for the broad-strokes information, there are few better places to start than Smartgrid.gov. The "What Is the Smart Grid?" section is specifically geared toward consumers and policy makers to help them understand the value of upgrading the grid with advanced sensing and two-way communications capabilities.

If you need to get down into the weeds, the Smart Grid Information Clearinghouse is an excellent resource aimed at utility professionals. Established by a grant through the U.S. Department of Energy, the Clearinghouse gathers detailed information on deployment experience, including cost-benefit analyses and performance data (available soon). Taking advantage of the work already done by other utilities could provide a valuable edge in your own project planning.

These are exciting times to be involved in energy efficiency. It is especially exciting to watch utilities across the country venture forth on next-generation grid projects. These projects will allow them to make use of their generation, transmission and distribution resources more efficiently, more effectively integrate renewables and electric vehicles, and ultimately, help save their customers money.

**For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb4.aspx**

Website of the month:

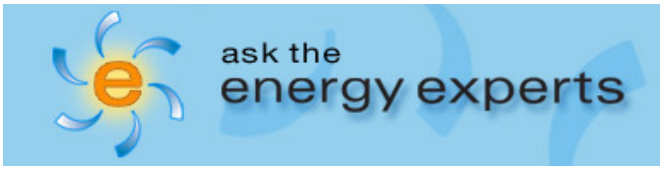
Western's Energy Experts www.energyexperts.org

Wouldn't it be great to have a team of energy engineers, specialists and librarians to answer your questions, research technology claims and point you toward case studies and white papers that address your specific situation? Of course it would, which is why Western's Energy Services sponsors the Energy Experts, a free online service that combines hotline, database and library.

Washington State University's (WSU) Energy Extension Program provides the support for Energy Experts with a staff of about 100 people. Western has partnered for many years with WSU on the web resource formerly known as the Power Line. In 2009, WSU changed the site's name to better reflect its mission to provide timely information on energy efficiency and renewable energy. Its customers include Federal, state and local agencies; Native American tribes; large and small businesses; universities and consumers.

Top picks

Several popular Energy Expert tools occupy a permanent and prominent place in the left navigation of the Energy Services website. Western customers and their consumers use calculators for air conditioning, heating and irrigation pump efficiency to estimate their energy costs and determine paybacks for energy-efficiency measures. Energy Experts released its new Pool Energy Use calculator to optimize energy consumption for heating. Utilities with lots of pools in their territories—that's you California and Arizona—should spend some time experimenting with the calculator and offer Energy Experts feedback.



Two databases serve visitors who want to browse or thoroughly research programs and technologies for improving efficiency. Energy Solutions provides a searchable database of thousands of resources covering six customer sectors and 31 topic areas. The experts have compiled articles, reports, studies and periodicals, as well as directories, software, organizations and codes and standards to help users choose and implement projects.

The second searchable database, Utility Options, specifically addresses the needs of power providers in today's fast-changing electricity industry. Western sponsors this collection of examples of utility programs for energy efficiency, renewable energy, load management, new technologies, environmental issues, diversification, customer service and marketing. Users can also submit their own program examples to be included in the database.

Dig deeper

Energy Experts have more to offer utilities, so don't limit your exploration of the website to just the links on Energy Services. Follow industry news with the monthly Energy Experts eNews and biweekly Energy Newsbriefs. Use the newsletters, fact sheets, articles and tips from marketing and outreach resources to start or enhance your conservation program. There are also links to promotional product suppliers, campaigns, multimedia materials and photos. Most are available at no cost, although WSU asks that users credit the source.

A resource dedicated to helping consumer-owned utilities to succeed cannot overlook the ongoing challenge of finding and training employees. Energy Experts provides users with tools to match jobs with qualified workers now, and to maintain the skills the utility workforce will need in the future. Users can post openings on Energy Related Jobs, where job hunters can search by keyword for new positions. Find upcoming trainings all over the country on the Events Calendar, which is also on the Energy Services homepage, or use the list of training providers to schedule in-house training. Users can also find educational programs in their area to gain new skills and further their careers.

And, of course, technical assistance tailored to your needs is as close as your phone or computer with Energy Experts hotline. Submit your question online or call 1-800-769-3756. Your question—and the solution—may even be featured in the next Ask the Energy Experts column in the Energy Services Bulletin!

**For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb5.aspx**

Science training *from page 1*

the tools to understand why fossil fuels will continue to be part of the energy mix for some time to come," said Dennis.

Another appealing aspect of the CSI program was the curricula aligns with national and regional education standards. For teachers in the Rocky Mountain region, the Colorado School of Mines offers graduate level continuing education credits for the training at a reduced cost. "Offering teacher development training gave us a way to support school districts in member communities," Dennis observed. "That's a big help for teachers, especially in rural areas that don't have nearby colleges."

Investing in education

Tri-State has supported science and technology education with donations to 4H and Future Farmers of America programs in its service territory. But it was The Keystone Center that first suggested the partnership, and invited Dennis to attend a CSI training institute, "and I was very impressed," she said. "It was a well rounded program that didn't present any foregone conclusions."

Dennis arranged for The Keystone Center to give another presentation to Tri-State's CEO, and he agreed that the program was a good investment in member community development. Tri-State offered its facilities and paid for the tuition, travel expenses, meals and lodging for teachers recruited by member system managers from their local schools. Member co-ops contributed $250 for lab supplies that Tri-State matched. "The Keystone Center really understands about limited budgets, so the experiments are very creative in their use of supplies," Dennis explained.

The supply fees will buy items like beakers, plastic trays, tubing and poker chips. Tri-State also sent the attendees home with enough safety glasses for their students.

Lessons learned

Some larger member systems chose not to promote the programs because they had too many school districts in their territory to pick just one teacher. Dennis also acknowledged that some co-ops might have been concerned about bringing a controversial topic into their local classrooms. However, she suspects that the unbiased nature of the curricula and the enthusiasm of the teachers who attended the training can overcome that concern.

In all, the summer school experience was a great one for Tri-State, The Keystone Center and, most of all, for the teachers. "They were thrilled to have new ideas and innovative labs to take back to their students," said Dennis. "We are really looking forward to hearing from them once they get back in the classroom."

For links to more resources,
visit http://ww2.wapa.gov/sites/western/es/pubs/esb/Pages/esb1.aspx

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